

# Sterilization with steam

Effective, environmental and personal safe

The process of steam sterilization has proven itself for years, and it is the safest method of sterilization to date. Hot steam destroys all living micro-organisms and thus ensures efficient and reliable results without the use of toxic substances. Accordingly, contributes to protecting the environment from additional noxious contaminants and above all minimizes personnel contact with harmful chemicals.

## What exactly happens during steam sterilization?

Under normal conditions, at atmospheric pressure, the water vapour does not exceed 100° Celsius, and consequently it would take a long time to eliminate all germs on these conditions. Steam sterilizers operate at much higher temperatures (and pressures), which allows to drastically shorten sterilization times while increasing process efficiency and reliability. First, it is essential that the water steam comes into direct contact with the processed items. Thus, steam will be able to deliver all its stored energy, in the form of heat, by condensing onto the surfaces of the instruments. This thermal energy, released within a certain time period, will kill all different types of germs. When instruments with lumens of any kind are being sterilized, residual air pockets can form and remain inside the cavities, thus preventing steam to penetrate into these spaces. The consequences are unsterile patches within the instrument lumens. At this moment one of the features of steam sterilizers comes into play: By applying vacuum technique, air is suctioned out of the sterilization chamber to allow steam to fill the chamber completely. This process is repeated for several times to ensure that as much air as necessary is removed from the chamber. As a result, a vacuum is built up and the steam generated can flow unhindered within the chamber and reach all inner and outer surfaces, including the now air free, unobstructed small lumens of the instruments. By continuously releasing steam into the chamber, the pressure inside increases. Consequently, so-called strained steam forms, which is accompanied by a rise in temperature up to 134°C.

With increased temperature and pressure the time needed to kill germs changes effectively, as it shortens considerably.

**Good to know:** **Sterilizers with vacuum technology** enable quicker automatic safe drying of the sterile goods within the autoclave chamber, as the drying process is also performed under vacuum. During the cool down process, steam and condensed water droplets are removed from the autoclave repeatedly, so drying happens fast and gentle.